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25X1

Reference: Contract RD-113Subject: Task III Program Report

Gentlemen:

The present status of this sequence camera prototype is that of customer testing. While current performance may be considered as acceptable, there have been many problems related to the prototype development which at present should receive some pertinent discussion and resolution of further objectives.

The original objectives of the program were in time modified in various phases of progressive design to incorporate a variety of additional features and associated components. The interdependence and interrelationship of these added features were not fully recognized in their complexity until their obvious appearance in final assembly and test. While it is felt that these procedures are consistent with normal development cycle of a complex photographic system, it should be kept in mind that many new state of the art features were incorporated as a function of time to the benefit of and consistent with the objectives for an extremely versatile photographic system.

The problem as views it is not one of design philosophy, but rather one of practicality and reliability. Each new feature added periodically was devoid of the opportunity to more properly integrate its function within the overall system. As a result, while each of these component parts function in a satisfactory fashion, there is obvious and undesirable complexity which has contributed to lowered reliability. In a

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DEPARTMENT OF DEFENSE
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CLASSIFICATION

CONFIDENTIAL

25X1

Page 2

September 3, 1958

similar fashion the desirable factors of ease of maintenance or repair have in our opinion become unnecessarily complex.

Five additional systems are as yet to be produced subsequent to approval of the prototype. Further, some desirable changes and additions to this capability have been discussed and are to be incorporated in the remaining quantity.

Unfortunately too, the problems encountered in final phase of the prototype system also involved rather extensive rework and tests which have resulted in this time as an unanticipated expenditure. In view of this and the changes planned at this time, we are taking this opportunity of submitting a detailed cost review for each category for the sake of clarity. Under the heading of additional work, we include, (1) Basic Contract and (2) Change in Scope. All work indicated in the column "Basic Contract" are shown in costs as less fee. By the same token overrun costs are similarly computed.

We trust that you will find this satisfactory. We shall await your early reply as to further procedures.

Sincerely yours,

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HRG:aw
Encl.

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25X1

TASK III

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	<u>BASIC CONTRACT</u>	<u>SCOPE CHANGE</u>
A) DATA RECORDING		X
B) END OF DAY INDICATOR		X
C) NEW TIMER / BURST CONTROL	X	
D) APERTURE CONTROL REDESIGN	X	
E) GENERAL DESIGN SIMPLIFICATION	X	
F) BATTERY PACK REDESIGN		X
G) NEW OPTICAL BORESIGHT		X
H) AUTOMATIC BORESIGHT CONTROL	X	
I) RANGE FINDER		X
J) BATTERY CHARGER DESIGN		X
K) NEW LENS ADAPTERS		X
L) MAGAZINE REDESIGN (200 FEET)	X	
M) PROVISION FOR NIGHT CAPABILITY		X

2) DESCRIPTION

- A) THE DATA RECORDING CONTEMPLATED WILL UTILIZE THE OUTPUT OF TIMER (C) TO PROVIDE A PULSE LIGHT RECORDING OF ONE HOUR INTERVALS ON A CODED BASIS RATHER THAN DIRECT READING. THE RECORDED "DOT" WILL BE PLACED EITHER IN THE PERFORATE AREA OR BETWEEN FRAMES BY MEANS OF OPTICAL PIPING OF LIGHT.
- B) THE END OF DAY INDICATOR WILL ALSO BE PROVIDED BY MEANS OF ANOTHER SIMILAR DOT RECORDING INTERCONNECTED WITH THE LOW LEVEL CUTOFF SWITCH AND ARRANGED TO OPERATE WITH THE EXPOSURE CONTROL CIRCUIT. THIS RECORDING WILL INDICATE AT WHAT TIME THE EXPOSURE CONTROL CIRCUIT WENT INTO STANDBY DUE TO LOW LIGHT LEVEL CONDITION.
- C) THE NEW TIMER AND BURST CONTROL MECHANISM IS TO BE REDESIGNED USING PRINTED CIRCUIT CONTACT ARRAYS AND A NEWLY DEVELOPED LOW DRAIN MOTOR.

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SECRET
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PAGE 2.

THIS ASSEMBLY WILL NOT ONLY BE INDICATIVE OF LOWERED COMPLEXITY BUT IN ADDITION PROVIDE A MARKED SAVING IN POWER REQUIREMENT. THE PROTOTYPE UNIT NOW OPERATES CONTINUOUSLY AT 50 MILS DRAIN, WHEREAS THE NEW DESIGN CAN BE MADE TO OPERATE AT APPROXIMATELY 4 MILS DRAIN. THE NEW DESIGN WOULD OFFER SIMPLER CALIBRATION AND PACKAGE REPLACEMENT FEATURES.

- D) THE APERTURE CONTROL REDESIGN INVOLVES SYSTEM SIMPLIFICATION AND REDUCED POWER DRAIN. THE PRESENT 4 POWER LEAD SYSTEM WOULD INVOLVE REDESIGN TO A 2 LEAD TAP SYSTEM, USING SEALED COMPONENTS TO INCREASE RELIABILITY AND MAINTAIN THE PRESENT LOW POWER DRAIN. TO REDUCE THE PRESENT MECHANICAL FRONT END PROBLEMS, CERTAIN ELECTRONIC PARTS ARE TO BE REPOSITIONED FOR EASE OF ASSEMBLY, MAINTENANCE, AND CALIBRATION.
- E) THE DESIGN SIMPLIFICATION REFERRED TO IS THAT RELATED TO A COMPONENT DESIGN REVIEW DIRECTED TO REDUCE COMPLEXITY AND RAISE RELIABILITY OF OTHER EXISTING ITEMS NOT INCLUDED IN THIS LISTING, SUCH AS LENS LOCK, LENS EXTENSION SUPPORT, TRANSPORT, SHUTTER DRIVE, MAGAZINE REGISTRATION, ETC.
- F) THE DESIGN OF A BATTERY PACK TO SUITABLY CONTAIN A BATTERY, RECEIVER, ANTENNA, SWITCHES, AND CORD CONNECTORS FOR ROUGH FIELD HANDLING. EXTERNAL PROVISIONS FOR BATTERY RECHARGING ARE ENVISIONED.
- G) A NEW OPTICAL BORESIGHT TO PROVIDE HIGH POWER MAGNIFICATION FOR PRECISION FOCUSING, COMPLETE WITH SUITABLE RETICLE AND REFERENCE GLASS PLATE.
- H) REDESIGN OF THE BORESIGHT CONTROL TO ELIMINATE THE FINGER ACTIVATED DEVICE PRESENT ON THE PROTOTYPE. AN ADDITIONAL POSITION ON THE SELECTOR SWITCH WILL ALLOW FOR "BORESIGHT" TO OCCUR AUTOMATICALLY. ANY CHANGE FROM THIS POSITION WILL RESET THE CAMERA TO THE SELECTED OPERATING MODE.
- I) THE RANGEFINDER IS PRESENTLY CONTEMPLATED AS A PURCHASED PART TO WHICH ADDITIONAL ENGRAVING IS TO BE ADDED. GENERALLY NO CALIBRATION IS SUPPLIED BETWEEN 300 FEET TO INFINITY, BUT FOR PURPOSES OF ITS USE WITH THIS SYSTEM IT IS CONSIDERED NECESSARY.
- J) THE BATTERY CHARGER CONTEMPLATED REPRESENTS A MODIFICATION OF A COMMERCIAL UNIT PRESENTLY AVAILABLE, AND SUITABLE FOR NICKEL, CADMIUM, AND SILVER CELL BATTERY TYPES. THE CONVERSION RELATES TO PROVIDING A VOLTAGE SENSING RATHER THAN TIME BASIS FOR CHARGING OF BATTERIES.
- K) NEW LENS ADAPTERS HAVE BEEN REQUESTED FOR CONSIDERATION TO REPLACE THE STANDARD EYEMO LENS MOUNTS. IT IS RECOMMENDED THAT THIS CONVERSION BE CONSIDERED ONLY IN THE SLEEVE MATERIAL RATHER THAN IN THE ACTUAL SLEEVE REDESIGN, DUE TO RESTRICTED AREA PRESENTLY AVAILABLE ON THE CAMERA LENS BOARD.

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L) IN ACCORDANCE WITH THE ORIGINAL REQUIREMENT THE 200-FOOT MAGAZINE WAS PROVIDED WITH A CARTRIDGE FILM CASSETTE. THIS MAKES THAT MAGAZINE DIFFER FROM THE OTHER THREE MAGAZINES NORMALLY PROVIDED. THE ADDED

COMPLEXITY IS FELT TO BE UNDESIRABLE, AND AS A RESULT AN

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PAGE 3.

TERIOR REDESIGN TO MAKE IT CONFORM TO THE 400¹ DISPLACEMENT SPOOL MAGAZINE IS THEREFORE PLANNED.

- M) THE PROVISION FOR A NIGHT CAPABILITY STEMS PRIMARILY FROM THE LATEST FILM DEVELOPMENTS WHICH CAN NOW PROVIDE EXTREMELY FAST, REASONABLY FINE GRAIN EMULSIONS. THE NIGHT CAPABILITY REFERRED TO WOULD BE MANIFEST IN A TWO-POSITION SWITCH WHICH WOULD PROVIDE FOR CONTINUOUS OPERATION OF THE CAMERA SYSTEM AFTER THE LOW LIGHT LEVEL STANDBY CONDITION HAD BEEN REACHED. AT THIS SETTING THE SHUTTER WOULD OPERATE AT SLOWEST SETTING (1/50) WITH LENS APERTURE AT MAXIMUM SETTING USING THE A S A 800 FILM INDEX POSITION.

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DEPARTMENT OF DEFENSE
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CLASSIFICATION

September 3, 1958

25X1

TASK III

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4. Delivery Schedule:

Subsequent to the date of your notification to proceed, the final five (5) systems can be delivered in not more than seven (7) months time.

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